

REMARKS

The above amendment amends the specification to update references to related U.S. patent applications. No new matter is added.

Claims 1-20 were pending in the above-identified application when last examined and are amended as indicated above.

Claims 1, 2, 6, 7, and 12 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. patent No. 5,578,863 (De Poorter). Applicants respectfully traverse the rejection.

Independent claim 1 as amended distinguishes over De Poorter at least by reciting, “the cap includes an optical element positioned to reflect an optical signal between a path extending to the optoelectronic device and a path extending out of the structure.”

De Poorter is directed to an optoelectronic semiconductor device 10 such as a radiation-emitting semiconductor diode 3 that can be enclosed using a cap 11 with a window 13. (See Fig. 1 of DePoorter.) However, De Poorter fails to disclose or suggest an optical element that reflects an optical signal between s a path extending to the optoelectronic device and a path extending out of the structure. Accordingly, claim 1 is patentable over De Poorter.

Claims 2, 6, and 7 depend from claim 1 and are patentable over De Poorter for at least the same reasons that claim 1 is patentable over De Poorter.

Independent claim 12 distinguishes over De Poorter at least by reciting, “an optical signal of the optoelectronic device is incident on the optical element and there reflected between a path extending to the optoelectronic device and a path extending out of the cavity.” For reasons similar to those noted above, De Poorter fails to suggest reflecting an optical signal between a path extending to the optoelectronic device and a path extending out of the cavity. Accordingly, claim 12 is patentable over De Poorter.

For the above reasons, Applicants request reconsideration and withdrawal of this rejection under 35 U.S.C. § 102.

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Claims 1, 6-9, and 12 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. patent No. 5,801,402 (Shin). Applicants respectfully traverse the rejection.

Independent claim 1 distinguishes over Shin at least by reciting, “the cap includes an optical element positioned to reflect an optical signal between a path extending to the optoelectronic device and a substantially perpendicular path extending out of the structure.”

Shin is directed to VCSELs packaged with monitoring photodetectors. Fig. 3 of Shin, for example, illustrates an output controller 50 that includes a housing 54 having a projector window 56. Shin also discloses use of projector window 56 (Fig. 3), a reflective coating (Fig. 4), or a hologram 82 (Fig. 8) to direct a portion of the light from a VCSEL to a photodetector enclosed by the housing. Fig. 7 illustrates a hologram 81 that is separate from the housing but directs light to the photodetector in the housing. See, for example, the paragraph beginning at column 5, line 18 of Shin.

Shin fails to suggest reflecting an optical signal between a path extending to the optoelectronic device and a path extending out of the structure because Shin is directed to redirection for monitoring of an optical signal within a package and not to redirection of the output (or input) optical signal. Claim 1 is thus patentable over Shin.

Claims 6-9 depend from claim 1 and are patentable over Shin for at least the same reasons that claim 1 is patentable over Shin.

Independent claim 12 distinguishes over Shin at least by reciting, “an optical signal of the optoelectronic device is incident on the optical element and there reflected between a path extending to the optoelectronic device and a path extending out of the cavity.” As noted above, Shin fails to suggest reflecting an optical signal between a path extending to the optoelectronic device and a path extending out of the cavity. Accordingly, claim 12 is patentable over Shin.

For the above reasons, Applicants request reconsideration and withdrawal of this rejection under 35 U.S.C. § 102.

Claims 1-10, 12, 13 and 16 were rejected under 35 U.S.C. § 102(a) as anticipated by U.S. patent application publication No. 2004/0086011 (Bhandarkar). In response, Applicants are submitting a Declaration of Prior Invention to establish invention in this country of the subject matter of the rejected claims prior to October 30, 2002, the effective/filing date of Bhandarkar.

The Declaration of Prior Invention is supported by copies of pages from a laboratory notebook of Brenton A. Baugh (one of the co-inventors) and shows drawings of two embodiments of the structure recited in independent claim 1. The drawings and the accompanying handwritten notes on the notebook pages further indicate a process including electrical connection to a sub-mount, fabricating a cap, and bonding the cap to the sub-mount in a wafer level fabrication process. The Declaration of Prior Invention thus shows invention of embodiments of the structure of independent claim 1 and the processes of independent claims 12 and 17.

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The dates on the notebook pages have been redacted, but the Declaration of Prior Invention clearly sets forth that redacted dates were contemporary with setting down the invention in the laboratory notebook and are before October 30, 2002. The invention and the preparation of the notebook pages thus occurred before October 30, 2002.

The Declaration of Prior Invention further shows that invention was in the United States of America.

Applicants submit that the nature of the art of wafer processing and device packaging are such that the drawings show reduction to practice of some or all of the claims in the present application. Alternatively, the notebook pages show conception of the invention coupled with due diligence in development of the invention through the reduction to practice of prototypes on or before April 8, 2003.

In view of the accompanying Declaration of Prior Invention and pursuant to 37 C.F.R. § 131(a), Applicants request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(a). In the event that the Examiner deems that Bhandarkar claims the same patentable invention as defined in 37 C.F.R. § 41.203(a), Applicants suggest an interference pursuant to 37 C.F.R. § 41.202(a).

Claim 14 was rejected under 35 U.S.C. § 103(a) as unpatentable over Bhandarkar. Applicants respectfully traverse the rejection. Claims 17-19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Bhandarkar in view of Applicants' description of the related. As noted above, Bhandarkar has an effective date of October 30, 2002, which is after the invention of the subject matter of claims 14 and 17-19. Bhandarkar is therefore unavailable as the basis for rejection of claims 14 and 17-19, and Applicants request reconsideration and withdrawal of the rejections under 35 U.S.C. § 103.

Claims 11, 15, and 20 were objected to as dependent upon a rejected claim but were indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 11, 15, and 20 remain dependent from independent claims 1, 12, and 17, which are allowable for at least the reasons given above. Applicants accordingly request reconsideration and withdrawal of the objection to claims 11, 15, and 20.

New claims 21-28 are added. New independent claim 21 is patentable at least for reciting, "a cap made of silicon that attached to the sub-mount to form a cavity enclosing the optoelectronic device, wherein the cap includes a reflector that is in a path of an optical

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signal of the optoelectronic device and on a cavity wall along a <111> plane of the crystal structure of the silicon.” Claims 22-24 depend from claim 21 and are patentable for at least the same reasons that claim 21 is patentable. Independent claim 25 is patentable at least for reciting, “fabricating a cap by etching a silicon substrate to create a depression, and forming a reflective area on a wall of the depression that coincides with a <111> plane of a crystal structure of the silicon substrate.” Claims 26-28 depend from claim 25 and are patentable for at least the same reasons that claim 25 is patentable.

In summary, claims 1-20 were pending in the application. This response amends claims 1, 3, 11, 12, and 17 and adds claims 21-28. For the above reasons, Applicants respectfully request allowance of the application including claims 1-28.

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Respectfully submitted,



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